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# Breakfast, food consumption pattern and nutritional status among private university students in Shah Alam, Malaysia

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**Abstract**
Poor food consumption pattern and breakfast habit result in poor nutritional status and increased risks of diseases in students. Hence, a quantitative research to study breakfast, food consumption pattern and nutritional status of private university students was conducted. Objective of the research was to determine association between breakfast taking habit and food consumption pattern with nutritional status of the students, measured as ideal BMI. A questionnaire containing 24 items was administered to 384 respondents (161 male and 223 female) using convenience sampling method. Analysis showed that 52.9% and 33.1% of respondents had high frequency (measured as often and always on Likert scale) of eating outside and eating junk food, respectively A total of 54.9% respondents had ideal BMI. On the other hand, 26.8% respondents were observed to be overweight, while 8.9% were obese, with average BMI of the respondents recorded as 24. More than 50% of the respondents were also found to have a waist circumference of 30 to 39 inches, with an average of 31 inches. As a conclusion, the nutritional status of the students considered good, but still breakfast consumption is not high. More promotion about the importance of breakfast taking should be done among university students.

**Keywords:** Food consumption pattern, breakfast, attitude, nutritional status

## Introduction
Breakfast is the first meal of the day and is predicted to be taken after 7-8 hours of sleep and is mostly skipped by the university students. Different investigation studies show that unhealthy nutrient intake and breakfast omission add to poor glycaemic level, miserable knowledge and scholarly performance as well as accelerative ratio of piteous nutritional status among youths. [1]. According to Ayranci *et al*. (2010) [2] breakfast is the meal that keep a student active and alert to work for various hours in a day prior to lunch break. Due to skipping of breakfast the students find difficulty in attending long lectures, also their understanding power is impacted which further leads to poor scholarly performance. It has been suggested that breakfast skipping and omitting meals and intake of unhealthy or junk foods can result into nutrient deficiency and poor nutritional status. Due to this aspect, it has been ascertained that many of the college students are facing issues of poor eye sight, depression, poor self-esteem, depression, unconsciousness, anxiety and poor memory [3]. Spanos and Hankey (2010) [4] stated that poor nutritional intake is major cause of poor academic performance and in worst case it leads to premature deaths among adults due to various metabolic disorders. It is crucial for university students to avoid junk foods, such as soda, alcohol etc. Instead, the students must have more fruits, vegetables and organic food. The convenience food that is generally preferred by college going students have high content of salt, saturated fats and lack of important micro and macro nutrients. Due to change in food habits and dietary intake the health of youths is adversely affected [5]. Poor eating habits is a major public health concern among young adults who experienced transition into university life [6] during which, they are exposed to stress and lack of time [7]. These factors pose a barrier against adoption of healthy behaviours, such as poor eating habits and substance abuse [6]. Although these behaviours of students are considered temporary, as part of university life; unhealthy habits picked up at this age generally persist in older adult life [8]. University students tend to make their own food choices [9] based on cost of food and availability of fast food [10]. They lack knowledge of healthy food choices that may affect eating habits and nutritional status negatively [11]. Malaysia study found that only 19% of university students consumed vegetables more than three times per week [10].

University students had frequent snacking habits [13] and had a higher frequency of fast food consumption [13]. They often select fast food due to its palatability, availability and convenience [12]. The aim of our study was to explore breakfast, food consumption pattern and nutritional status among private university students

## Method

The research undertaken is a quantitative, cross-sectional, exploratory study in which nutritional status, breakfast and food consumption patterns of students are investigated. A questionnaire developed by researcher is used as the research instrumentation to assess parameters of the study through field-survey technique. The research was conducted within the area of private university in Shah Alam, Malaysia. As per the research title suggests, population for this research is comprised of MSU students. Calculated size of research sample is withdrawn from the population of MSU students based on following formula

$n = \frac{z^2 \times p \times (1-p)}{e^2}$ whereby: *z = value from standard normal distribution corresponding to 95% confidence e = precision, 0.05 p = proportion of population used as sample (assumed as 0.5)*

$$n = \frac{1.96^2 \times 0.5 \times 0.5}{0.05^2} = 384$$

Therefore, 384 students were used as respondents to conduct the questionnaire.

Inclusion criteria of study subjects include male and female students, aged between 20to25 and generally healthy. Exclusion criteria include subjects receiving any form of treatment for chronic medical conditions (hypertension, diabetes, cardiovascular diseases, cancer), subjects with obesity or eating disorders (anorexia nervosa, bulimia nervosa, and binge-eating disorder), subjects who are involved in any clinical trials of drugs, dietary supplements, nutraceuticals or functional food and subjects who are on special diet (gluten-free, Paleo, Atkins, low-calorie, dairy-free). All eligible subjects (respondents) are provided with a form of informed consent before participating in the survey. This is to clarify subjects' understanding and willingness to participate in the study. Informed consent helps respondents to understand the purpose, procedure, potential risks and benefits of their involvement in the study. Some ethical matters will be taken into consideration by the researcher. In this research, the primary issue is confidentiality of respondents' personal information and their response. The researcher has to convince the respondents that he/she will not gather or share any information with any third parties or for personal advantages.

An ethical approval from international medical school were obtained prior to data collection. Also written consent form was taken from all respondents.

## Result

A total of 384 students participated in our study. Female were more than male (58.1%), majority Indian (44.8%), majority have RM 2000-4000 monthly family income as shown in table 1. Details on breakfast consumption patterns were shown in table 2. Around (26.6%) consumed breakfast 2-3 times per week, at home (53.9%), eating breads/biscuits (46.6%).

Food consumption pattern shown in table 3, (40.6%) they sometimes eat outside, (42.2%) at hawker stall, the most common snack was candies/chocolate (25.5%). Table 4 shows the nutritional status of the respondents where majority were normal weight (54.9%) followed by overweight (26.8%)

**Table 1:** Demographic Profile of Respondents

| Gender | Frequency | % |
|---|---|---|
| Male | 161 | 41.9 |
| Female | 223 | 58.1 |
| Age | | |
| 20-23 | 271 | 70.6 |
| 24-27 | 89 | 23.2 |
| 28-31 | 17 | 4.4 |
| 32-35 | 1 | 0.3 |
| >35 | 6 | 1.6 |
| RACE | | |
| Malay | 143 | 37.2 |
| Chinese | 32 | 8.3 |
| Indian | 172 | 44.8 |
| Others | 37 | 9.6 |
| Family Income in Malaysian ringgit | | |
| Less than 2500 | 55 | 14.3 |
| 2500-4000 | 118 | 30.7 |
| 4001-6000 | 75 | 19.5 |
| 6001-8000 | 63 | 16.4 |
| 8001-10000 | 47 | 12.2 |

**Table 2:** Breakfast Consumption of Students

| **Times of breakfast consumption per week** | | |
|---|---|---|
| Never | 23 | 6.0 |
| Once | 24 | 6.2 |
| 2-3 | 102 | 26.6 |
| 4-5 | 56 | 14.6 |
| 6 | 30 | 7.8 |
| Daily | 149 | 38.8 |
| **Place to take breakfast** | | |
| Home/hostel | 207 | 53.9 |
| Outside | 177 | 46.1 |
| **Type of food taken as breakfast** | | |
| Food | | |
| Cereal | 97 | 25.3 |
| Bread/biscuit | 179 | 46.6 |
| Noodles/Rice | 81 | 21.1 |
| Others | 27 | 7.0 |

**Table 3:** Food Consumption Pattern

| Where to get food from? | Frequency | Percentage (%) |
|---|---|---|
| Place | | |
| Home cooked | 126 | 32.8 |
| Restaurant/Stall | 198 | 51.6 |
| Fast food outlet | 54 | 14.1 |
| Food delivery service | 5 | 1.3 |
| Others | 1 | 0.3 |
| **Frequency of eating outside** | | |
| Never | 7 | 1.8 |
| Rarely | 18 | 4.7 |
| Sometimes | 156 | 40.6 |
| Often | 134 | 34.9 |
| Always | 69 | 18.0 |
| **Options to eat outside** | | |
| Full service restaurants | 111 | 28.9 |
| Hawker stall | 162 | 42.2 |
| Fast food outlet | 111 | 28.9 |
| **How Often Eat Junk Food** | | |
| Never | 2 | 0.5 |
| Rarely | 50 | 13.0 |
| Sometimes | 205 | 53.4 |
| Often | 104 | 27.1 |
| Always | 23 | 6.0 |
| **Snack** | | |
| Fruits/Vegetable | 29 | 7.6 |
| Nuts/Cereal | 41 | 10.7 |
| Local kuih | 88 | 22.9 |
| Candies/chocolate/crackers | 98 | 25.5 |
| Yogurt/Ice cream | 63 | 16.4 |
| Bread/biscuits/cookies/cakes | 65 | 16.9 |

**Table 4:** Nutritional Status of Students

| BMI class | Frequency | Percentage |
|---|---|---|
| Underweight | 36 | 9.4 |
| Normal | 211 | 54.9 |
| Overweight | 103 | 26.8 |
| Obese | 34 | 8.9 |
| **Waist circumference** | | |
| 20-29 | 144 | 37.5 |
| 30-39 | 218 | 56.8 |
| 40 and more | 22 | 5.7 |

## Discussion

Frequency analysis showed that respondents of this study were comprised of 161 males and 223 female students, from various course of study. Majority of the respondents were between 20 to 23 years of age, which correspond to undergraduate's students. Analysis showed that respondents were comprised of students from multi ethnicity background. However, approximately 45% of them were Indians, followed by Malays. Analysis showed that a total of 359 respondents (93.5%) were single, while the rest 25 were married. Results showed that 52.1% (200) respondents had their study expenses taken care by sponsors, mainly PTPTN, MARA and Yayasan Negeri. Another 43.8% respondents stated family as the one paying for their studies, while the remaining either pay on their own or by other parties**.** Regular breakfast consumption among medical students is important for sufficient energy intake to overcome fatigue due to busy learning schedule [14]. However, it was found from the questionnaire that only 38.8% (149) respondents had the habit of taking breakfast every day, followed by 26.6% (102) who take breakfast 2 to 3 times in a week. According to Savige *et al*., (2007) [15], meal skipping (especially breakfast) is one of the common unhealthy eating patterns among young adults apart from eating outside, snacking and fast food consumption. Analysis revealed that majority of respondents prefer to have their breakfast either at home or hostel. This could be due to time constraint of the respondents, especially when they have classes early morning. Respondents were observed to have their breakfast alone (38.5%). This could also be attributed to their hectic schedule of classes in most of the mornings. Another 33.6% of respondents have breakfast with their friends. This is comparable to a study by Yahia *et al*., (2008) [13] who reported that 42.7% respondents in their study take breakfast with family or peers. Bread and biscuits were the most popular choice of food for the respondents' breakfast. It was shown that 46.6% of them take bread or biscuits for breakfast. Cereal and noodles/ rice were also preferred by the respondents with 25.2% and 21.1% respondents, respectively. Preference for bread and biscuits, once again, could be due to its convenience to obtain and consume. Furthermore, the relatively low cost of bread and biscuits could also be reason for this observation. Majority of respondents who eat outside prefer to visit hawker stalls, with 42.2% (163) of them. This could be most probably due to variety of food available at hawker stalls and also the price of food which is relatively cheap as compared to restaurants and fast food outlet. This could be associated to a study by Gan *et al*., (2011) [10] who stated that Malaysian university students tend to make their food choices based on cost of food and availability of fast food. This may affect their eating habits and nutritional status negatively. The frequent consumption of snacks and light meals is a recognizable aspect of teenage food behaviour [16]. Expectedly, it was shown from the frequency analysis that more than half (53.4%) of the respondents consume junk food on sometimes basis. This was indeed an alarming figure, as it indicates that the students were practising poor nutritional habit by eating junk food which are generally zero in nutrient but high in calories. Only 0.5% of them stated as 'never' consumed junk food. Most of the respondents reported that they prefer candies/chocolates/crackers and local kuih as snack. These corresponds to 25.5% and 22.9% respondents respectively. It is a worrisome scenario here as the preferred snacks are usually high in sugar, salt and oil, which are detrimental to health of the students; which can damage the heart, kidneys, and waistlines [17]. It has been argued by King *et al*., (2007) [18] that availability of shopping malls, convenience stores, vending machines and fast food outlets had equally contributed to unhealthy eating habits of youngsters. It was found that 54.9% respondents had normal (ideal) BMI, which corresponds to 211 students, while 35.7% of them were either overweight or obese. Obesity had been associated with a large number life-threatening disorders, such as cardiovascular, diseases, hypertension and diabetes [19]. A total of 56.8% of respondents had waistline between 30 to 39 inches. This, too, was an alarming data as only half of the respondents were indicated as having a good nutritional status. Thus, the university may help these students by planning and implementation of intervention programs, such as health campaigns and healthy lifestyle promotions.

**Conclusion**

The nutritional status of the students considered good, but still breakfast consumption is not high. More promotion about the importance of breakfast taking should be done among university students.

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